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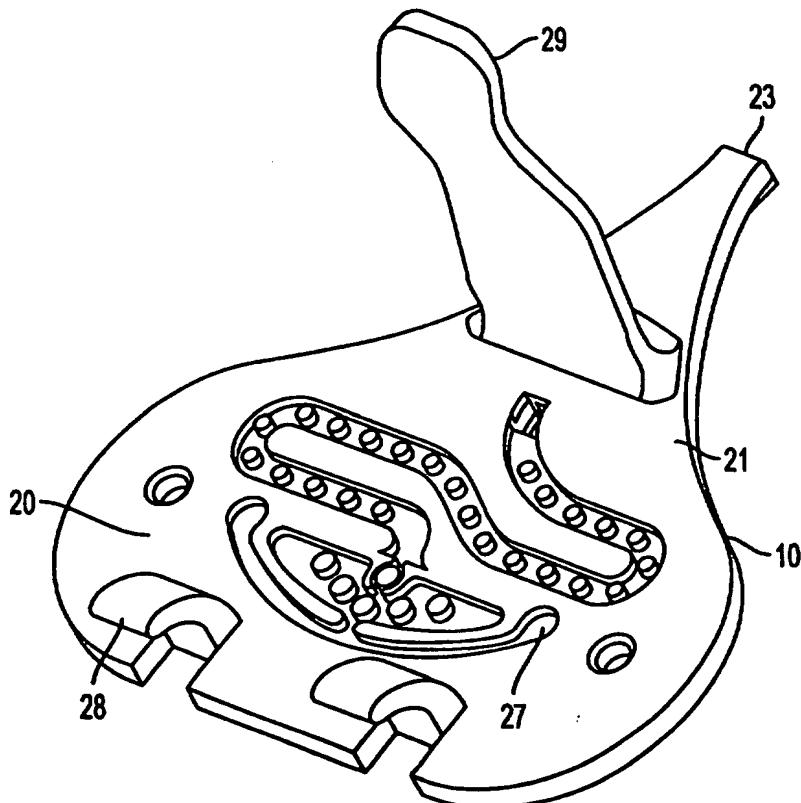
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*[Continued on next page]*

(54) Title: AEROSOL MIXING SYSTEM WITH COLUMNS



(57) Abstract: A mixing system and methods for mixing a plurality of constituents from a plurality of containers that includes a collar (30), a head (10), a cartridge (20) and, optionally a base (40). If present, the base is configured to hold and secure at least two containers (50). The collar is configured for coupling to the containers (50). A head (10) is coupled to the collar (20) and contains the cartridge (20). The cartridge includes a plenum (22), a mixing canal (24), and an outlet (23), that are connected to mix the constituents as they pass through the plenum, mixing canal and outlet and are released from the container. The mixing canal (24) includes a plurality of columns (26), which may be of any shape, to facilitate mixing. The system can also include a lever (29) for activating release of the constituents from the containers (50).



European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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**AMENDED CLAIMS**

[received by the International Bureau on 12 January 2004 (12.01.04);  
New claims 20-30 added]

passing the plurality of constituents around a plurality of columns, thoroughly mixing the constituents; and  
ejecting the thoroughly mixed constituents.

15. The method of claim 14, wherein the columns are cylindrical.
16. The method of claim 14, wherein the columns are oval.
17. A mixing system comprising:  
means for activating a plurality of actuators to release a plurality of constituents;  
means for separately passing each of the plurality of constituents into a mixing means;  
means for mixing the plurality of constituents comprising a plurality of columns; and  
means for ejecting the thoroughly mixed constituents.
18. The system of claim 17, wherein the columns are cylindrical.
19. The system of claim 17, wherein the columns number about 10 to about 50.
20. A mixing system comprising:  
two containers of constituents;  
a cartridge having a mixing canal for the constituents in said containers;  
a head for holding said cartridge; and  
a collar connecting said head and said cartridge to said containers.
21. The system of claim 20, wherein the head includes a lever to activate release of the constituents into the cartridge.
22. The system of claim 20, wherein the constituents of said containers are released by pressing on the top of said head.

23. The system of claim 20, wherein the mixing canal comprises a hollow through which the constituents are passed and mixed.
24. The system of claim 20, wherein said collar, said head and said cartridge are coupled by a snap-to-fit or friction-fit method.
25. The system of claim 20, further comprising an outlet port through which mixed constituents are dispensed.
26. The system of claim 20, wherein the head internally holds the cartridge.
27. A method of mixing a plurality of constituents from pressurized containers comprising the steps of:  
providing two containers that contain the constituents to be mixed;  
providing a mixing system that comprises  
a cartridge having a mixing canal for mixing constituents contained in said containers;  
a head for holding said cartridge; and  
a collar;  
connecting said containers to said head and said cartridge with said collar;  
actuating a valve on each of said containers to release the constituents contained therein by pressing on the top of said head;  
separately passing each of the constituents into said cartridge; and  
ejecting the mixed constituents.
28. The method of claim 26, wherein the mixing canal comprises a hollow through which the constituents are passed and mixed.

29. The method of claim 26, wherein said collar, said head and said cartridge are coupled by a snap-to-fit or friction-fit method.

30. A mixing system comprising:

- a) means for activating a plurality of actuators to release constituents from each of a plurality of containers;
- b) separate means for thoroughly mixing the plurality of constituents, comprising a means for passing each of the plurality of constituents into the mixing means and means for ejecting the thoroughly mixed constituents;
- c) separate means for attaching the activating means and the mixing means to the containers.

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/22282

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B67D 5/60; B01F 5/06,  
US CL : 222/145.5, 366/336

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
U.S. : 222/145.5, 145.1; 366/336, 181.5

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 199 11776 A1 (Merch Patent GMBH) 21 September 2000 (21.09.2000), see entire document.	1-19
A	FR 2 669 243 A1 (PARJUMS GIVENCHY) 22 May 1992 (22.05.1992), See entire document.	1-19
A	US 5,611,463 A (FAVRE) 18 March 1997 (18.03.1997), see entire document.	1-19
A	US 6,281,254 B1 (NAKAJIMA et al) 28 August 2001, (28.08.2001), see entire document.	6, 10, and 16
A	US 6,457,854 B1 (KOOP et al) 01 October 2002 (01.10.2002), see entire document.	5, 9, 15, 18
A	US 3,236457 A (KENNEDY et al) 22 February 1966 (22.02.1966), see element 17,23, 22.	1-19

Further documents are listed in the continuation of Box C.

See patent family annex.

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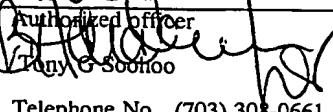
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